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LUBRICATING COMPOUND

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1 Claim. (Cl. 87-9)

The invention relates to lubricating compounds and method of making such compounds, and more particularly to wire drawing compounds and their method of manufacture.

5 Lubricating compounds for wire drawing machines, particularly machines designed for drawing wire at high speed or metal processing machines in general, have in many instances consisted principally of a lubricant, such as tallow, 10 lard oil, fish oil, or vegetable oils mixed with soap and water, the soap acting as a flotation agent for the tallow or oil. Experience has proved the requirement of having the tallow finely dispersed in the soap in very small particles. As is particularly true in the drawing of wire, the tallow which acts as a lubricating medium forms a thin surface layer on the wire being drawn and also on the mouth and reducing aperture of the reducing die. If the tallow is not finely dispersed 20 throughout the soap insufficient and inadequate lubrication results, and consequently a wire of inaccurate size is produced and the dies either become badly worn or subject the wire to excessive tension frequently resulting in broken wire. 25 When the tallow is not finely dispersed not only does improper lubrication result, but it collects at the mouth of the die and accumulates an excessive amount of copper dust from the wire being reduced. Due to this collection of copper dust extreme heating results and replacement of the dies or the restringing of the dies because of broken wire is necessary. It is also noted that 30 when preparing a wire drawing compound consisting of water, tallow, and soap it is, in many instances, necessary to use the compound in the wire drawing machine for a considerable period before sufficient and adequate lubrication is achieved. Many theories as to the reason for 35 this condition have been advanced, but so far no definite conclusion as to the actual cause has been agreed to by wire drawing experts. In view of the facts as stated it is highly desirable to have a wire drawing compound in which the tallow or 40 the lubricating medium is finely, readily, and quickly dispersed in the flotation agent.

The object of the present invention is the provision of a lubricating compound which possesses extremely high lubricating properties and in 45 which these lubricating properties may be developed in a relatively short period of time and retained for a considerable period of time.

In accordance with this object, one embodiment of the invention contemplates the use of a 50 soluble alginate either alone or in combination

with another medium as the flotation or suspending agent for the lubricant.

Other objects and features of the invention will be apparent from the following detailed description of a wire drawing compound embodying 60 the invention.

One lubricating compound which has proved very satisfactory for wire drawing consists of the following ingredients mixed in the proportions named by weight: Anhydrous sodium alginate, 1 65 part; water, 195 parts; tallow, 4 parts. In the preparation of this compound the sodium alginate is dissolved in 25 parts of water, the lubricant then added, and the whole mixture is boiled for one hour by direct injection of live steam. 70 After allowing the mixture to cool to approximately 150° F. it is then passed through a homogenizer or colloid mill at the rate of about 300 gallons per hour to obtain a fine dispersion of the fat particles, whereupon the mixture is gradually 75 added to the remainder of the water which is forceably agitated by continuously pumping the entire compound through a return circulating system which in some cases may include the wire drawing machine. 80

Another formula which gives very satisfactory results is as follows: Anhydrous sodium alginate, 1 part; water, 195 parts; soap, 2 parts; tallow, 4 parts. In the preparation of this compound, the sodium alginate is dissolved in 25 parts of 85 warm water, the soap is then added to the warm solution, the lubricant is next added, and the entire mixture boiled for one hour. The mixture is then passed through a colloid mill and the remainder of the water added and the compound 90 thoroughly agitated as described for the aforementioned compound.

In preparing lubricating compounds with the alginates there may be used in place of the tallow or in combination therewith any of the well known 95 lubricants, such as graphite, rapeseed oil, sperm oil, seal oil, lard oil, mineral oil, fish oil, cotton seed oil, etc.

The lubricating compounds so obtained are very stable and effective for use in the drawing of 100 wire, since the alginate emulsion acts in the nature of a vehicle to conduct and deposit the lubricant onto the surface of the wire and the wire drawing apparatus where it will be of greatest service. These alginic lubricating compounds 105 have been found to give exceptionally good operating results since satisfactory lubricating properties are obtained immediately upon the compounds being put into use. In addition to this, 110 the compounds also effectively wash away del-

eterious foreign matter from the drawing dies and act as a cooling agent to prevent any considerable increase in temperature.

Another important advantage of these alginic compounds is the inherent characteristic they possess of having an unusually long, useful life in providing effective lubrication under continuous operating conditions. It is necessary, in some instances, with the ordinary lubricating compounds to make comparatively frequent additions of emulsions of lubricating agents since the compounds are unstable and the lubricants settle or separate out to thus decrease the lubricating efficiency. The addition of the alginate promotes the emulsification of the lubricants with the carrying medium, which is usually water, whereby the minute globules of lubricants are finely dispersed and retained in suspension for long periods of time. Hence, the alginate in the compound materially facilitates the emulsification and imparts a character of permanence to its lubricating life.

Lubricating compounds containing an alginate

also produce very effective cutting compounds, and it will be evident that the composition can be readily altered for other classes of lubricant.

Although the specific embodiment of the invention hereinbefore described calls for a sodium alginate, it will be understood that any other salt of alginic acid soluble in water or oil, such as ammonium, potassium, lithium, and magnesium alginates, may also be employed to give satisfactory results. Furthermore, it will be understood that the embodiments of the invention herein described are merely convenient and useful forms of the invention, which are capable of many other modifications without departing from the spirit and scope of the invention as defined by the appended claim.

What is claimed is:

A wire drawing compound comprising substantially one part of soluble alginate, four parts of tallow, two parts of soap, and one hundred and ninety-five parts of water.

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